

# FOSSIL INSECTS IN THE UNITED STATES NATIONAL MUSEUM.

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Recent studies on the fossil insects in the collection of the United States National Museum by the writer have covered a variety of subjects, which for the sake of convenience are treated below under separate headings.

## 1. FOSSIL INSECTS FROM SIBERIA.

Very little is known of the fossil insects of the vast Asiatic continent. Tertiary insects have been reported from few localities. In 1860 Murray<sup>1</sup> described certain beetles, *Lomatus hislopi*, *Meristos hunteri*, and three unnamed weevils, from the Tertiary of Nagpur, India. In 1876 Kawall<sup>2</sup> described a fossil larva as *Tineites crystalli* from the Tertiary of Ufalei, Siberia. In 1878 Heer<sup>3</sup> recorded a beetle as *Cistelites sachalinesis* from rocks doubtfully referred to the Oligocene, at Mgratsch, on Sachalin (Sakhalin) Island. In Nawa's "Insect World" (Gifu, Japan) for 1913 is a figure of a fossil ichneumonid labeled *Pimpla*, species. In 1910 Reis<sup>4</sup> discussed fossil Coleoptera from the fish shales of the Transbaikal. In 1920<sup>5</sup> T. B. Fletcher published on Indian fossil insects. The present writer (1916-1922) has recorded many species of insects from Burmese amber, the age of which is probably Eocene.<sup>6</sup>

Some time ago A. Kryshtofovich, of Vladivostok, sent to Dr. F. H. Knowlton two species of fossil insects collected by A. Kuznetsov on the Amagu River, Maritime Province, coast of Siberia, opposite the southern end of Sakhalin Island. These specimens were kindly transmitted to me for study and are described below. They have been placed in the United States National Museum. They are of more than ordinary interest on account of the locality and the fact that they represent new and rather remarkable

<sup>1</sup> Quart. Journ. Geol. Soc. London, vol. 16, pp. 182-184.

<sup>2</sup> Bull. Mosc., vol. 3, p. 171.

<sup>3</sup> Mem. Akad. Peterst., ser. 7, vol. 25, No. 12, p. 3, pl. 15, fig. 12.

<sup>4</sup> Explor. Geolog. Chem. de fer Siberie. St. Petersburg. p. 29.

<sup>5</sup> Rep. Pusa, Calcutta, vol. 3, pp. 983-989.

<sup>6</sup> Nature, June 3, 1922, p. 713.

genera. The rock is dense and gray, not unlike that of Florissant, but with a more irregular fracture. It is presumed to be of Miocene age and is reported to contain a flora including *Quercus platania* Heer, *Ginkgo adiantoides* (Unger) Heer, *Taxodium distichum* (Linnaeus) Richard, *Glyptostrobus europaeus* (Brongniart) Heer, *Porana*, new species, *Cornus studeri* Heer, *Grewia crenata* (Unger) Heer, *Diospyros brachysepalala* Al. Braun, etc. This might be as old as Lower Miocene, but additional information is much to be desired. The flora is a warm temperate, not at all tropical, one; the insects give the same indication, but are remarkable for their relatively large size as compared with their living representatives.<sup>7</sup>

## MECOPTERA.

### Family PANORPIDAE.

#### DINOPANORPA, new genus.

Based on a hind wing, remarkable for its relatively gigantic size and unusual breadth; venation nearly as in *Panorpa*, except that the first cross-vein between the media and cubitus is very long and oblique, a condition somewhat approached by *Panorpa venosa* Westwood. The first division of the radius ( $R_1$ ) is remarkable for ending practically parallel with the costa, forming an extremely acute angle.  $Sc_2$  leaves the radius only a very short distance beyond the termination of  $Sc_1$ , proceeding very obliquely to the costal margin. At the base of the wing the media fuses with the cubitus for a short distance. The wing is dark brown, with scattered light spots.

*Genotype*.—*Dinopanorpa megarche*, new species.

#### DINOPANORPA MEGARCHE, new species.

Plate 1, fig. 1.

Hind wing 30 mm. long and 11 wide in middle; dark brown, with five rather narrow hyaline transverse bands represented in part by series of spots; the first by an elongate mark on lower half of wing beginning at cubitus; the second by a longitudinally elongate stripe below the costa, a larger one below the radial sector, and a vertical series of four spots below the apical end of this; the third by two large spots above, and two still larger below and beyond them; the fourth by the upper two spots only, placed obliquely, the lower one

<sup>7</sup> Kryshstofovich has described the *Porana* as *P. sichota-alinensis*; I have seen the type, a very beautiful specimen. Last July my wife and I made collections in this Siberian locality, which is on the Kudia River, a branch of the Amagu, about 4 miles from the coast. The fossil insects of this collection are now being described; the additional plants will be described by Kryshstofovich. I also visited Nawa's Museum at Gifu, Japan, and saw there a very fine series of Japanese fossil insects, apparently late Tertiary, but at present unstudied.

more apical; the fifth by a single oblique spot, divided by two nervures. The apical third of the wing is obliterated, except in the costal region.  $Sc_1$  ending 18 mm. from base of wing; r-m cross-vein 13 mm. from base of wing; lower end of oblique m-cu. cross-vein 9 mm. from base of wing. Longitudinal veins very strong, cross-veins for the most part very faint. The cross-veins from costa to subcosta are more numerous than in *Panorpa*.

*Holotype*.—Cat. No. 69173, U.S.N.M.

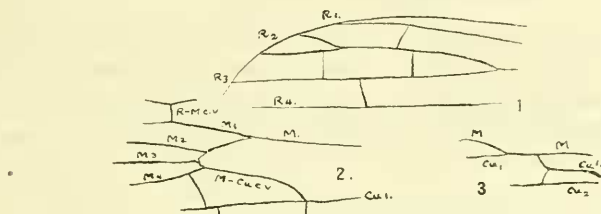


FIG. 1.—DIAGRAM OF VENATION OF *DINOPANORPHA MEGARCHE*. 1. COSTOAPICAL REGION. 2. REGION OF M-CU CROSS VEIN. 3. REGION OF UNION OF M WITH CU (HIND WING).

## HOMOPTERA.

### Family DELPHACIDAE.

#### AMAGUA, new genus.

Relatively large robust insects, the anterior wings or elytra rather narrow, parallel sided (apical part lost), with distinct veins; m-cu. cross vein long, branching of  $cu_1$  only a little beyond it; anal oblique, not in line with long axis of wing. The general structure of the elytron is not very different from that of *Stenocranus saccharivorus* Westwood, but there are numerous differences of detail. The *Stenocranus* is relatively minute.

*Genotype*.—*Amagua fortis*, new species.

#### AMAGUA FORTIS, new species.

Plate 1, fig. 2.

Probable length about 17 mm.; abdomen dark brown, 5 mm broad; elytra (tegmina) 3.7 mm. broad in middle; venation as shown in figure.

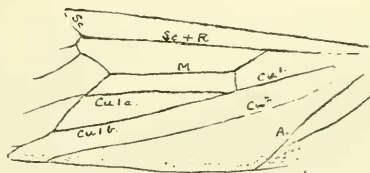


FIG. 2.—DIAGRAM OF VENATION OF *AMAGUA FORTIS*.

*Holotype*.—Cat. No. 69174, U.S.N.M.

2. FOSSIL INSECTS AND AN ARACHNID FROM THE EOCENE SHALES  
OF COLORADO.

DIPTERA.

Family TRYPETIDAE.

EOPHLEBOMYIA, new genus.

Small robust flies, with rather short abdomen; head rather small, with short but evident bristles on vertex; antennae ordinary; the last joint elongate, broadly rounded at end, not flattened on either side; thorax elevated and gibbous anteriorly, dorsally flattened in lateral profile, beset with very small and fine hairs arranged in longitudinal rows, but scutellum with very long stout bristles; abdomen with short hairs, and no macrochetæ; legs ordinary, tibiae without preapical bristles; minute dark hairs on outer side of tibiae arranged in two fine lines; wings broad, ample, not especially long, perfectly clear, without spots or bands; auxiliary vein bent abruptly upward but not angular, reaching the costa at somewhat less than a right angle, and having at its end a group of three small black bristles, considerably larger than the costal bristles; the auxiliary is distinct throughout, but slender and pale, much weaker than the first vein; first vein reaching the costa about the middle of the wing, little curved, forming an acute angle much as in *Neospilota*, but not at all bristly; marginal cell long and narrow, apically very acute; submarginal expanded at end, much as in *Polymorphomyia*; first posterior with the veins bounding its apical part parallel; anterior cross-vein more remote from end of discoidal cell than in modern genera, and also shorter, not very oblique, the upper side of discal cell drawn upward to meet the cross-vein, and anteriorly to it curved in the fashion more exaggerated in *Glossina*; anal cell short and closed, not bulging as in Sapromyzidæ, and not produced at lower apical corner.

*Genotype*.—*Eophlebomyia claripennis*, new species.

EOPHLEBOMYIA CLARIPENNIS, new species.

Plate 2, fig. 7.

Length 4.5 mm. (abdomen curved downward); length of thorax 2.2 mm.; wing about 4.5 mm. long and 2.2 broad; dark brown, including legs, but face pale, and thorax dorsally with longitudinal stripes, much as in *Dacus oleae*; scutellum not prominent; first abdominal segment with a dark mark above. The specimen appears to be a male.

The following measurements are in microns: Length of hind tibiae 1,230, of hind basitarsus 720; end of auxiliary to end of first vein, 800; anterior cross-vein to base of discal cell, 1,120, to end of discal, 830; length of anterior cross-vein, 80; apical side of discal cell, 608. The discal cell is shaped like the butt of a gun.

*Horizon and locality.*—Green River Eocene; head of East Alkali Gulch, about 8 miles south of De Beque, Colorado (John P. Byram, 1922).

*Holotype.*—Cat. No. 69175, U.S.N.M.

A remarkable little fly, which I at first thought to refer to the Anthomyiidae, but it appears to be acalyptrate, and the venation agrees better with Trypetidae. In certain respects, it agrees with what we should expect to find in an ancestor of the modern Trypetidae.

### Family MYCETOPHILIDAE.

#### ACNEMIA CYCLOSOMA, new species.

Plate 2, fig. 4.

Length about 5.5 mm.; dark brown, the under side of thorax and the femora yellowish-white; wings about 5 mm. long, broad, dilute brown, not spotted; hind tarsi, 3 mm. long. Antennae brown, over 2 mm. long, apparently 19-jointed, but the apical joints are very small; the middle joints are longer than broad, cylindrical; thorax almost exactly circular in lateral profile; subcosta absent or so faint as to be invisible in the fossil; radius reaching costa about 1 mm. before end of radial sector, the latter conspicuously and regularly curved apically; costal thickening not extending beyond end of radial sector; transverse (basal) section of radial sector 145 microns long, and a little over 2 mm. from base of wing; media with section between lower end of cross-vein to radius and fork about as long as the cross-vein; cubitus simple, arched.

*Horizon and locality.*—Green River Eocene; head of East Alkali Gulch, about 8 miles south of De Beque, Colorado (John P. Byram, 1922).

*Holotype.*—Cat. No. 69176, U.S.N.M.

Among the Mycetophilinae, *Acnemia* must be considered an advanced or specialized genus on account of the simple cubitus. In the genus *Acnemia*, the present insect is in some respects more specialized or modified than existing species, in spite of its antiquity. According to Johannsen, in all modern species of *Acnemia* the costa extends beyond the end of the radial sector (or should we say that the sector is produced beyond its junction with the margin of the wing?), but this character varies in extent. In *A. flaveola* Coquillett the extension is less than a fourth of the distance to the upper branch



of the media. It therefore seems hardly necessary to propose a new generic name for the fossil.

*Acnemia* is known to occur fossil in Europe; *A. bolsiusi* Meunier in Baltic amber, and *A. simplex* Cockerell in the Oligocene of the Isle of Wight.

### Family BIBIONIDAE.

#### PLECIA RHODOPTERINA, new species.

Plate 2, fig. 6.

*Female*.—Length 4.4 mm., robust, with small head and stout legs, the short antennae with joints considerably broader than long; wings 5 mm. long and slightly over 2 broad, ferruginous (as in *P. fulvicollis* Fabricius); section of radial sector between anterior cross-vein and the fork distinctly but not greatly shorter than upper branch of fork; section of media between cross-vein and fork distinctly but not much shorter than fork; lower branch of cubitus strongly curved downward apically.

*Horizon and locality*.—Green River Eocene; head of East Alkali Gulch, about 8 miles south of De Beque, Colorado. (John P. Byram, 1922.)

*Holotype*.—Cat. No. 69177, U.S.N.M.

Much smaller than any of the four species previously recorded from the Green River shales and having rather the aspect of a Mycetophilid.

### Family TIPULIDAE.

#### Genus CYTTAROMYIA Scudder.

This genus of Cyliindrotominae was founded by Scudder for a species (*C. fenestrata* Scudder) fossil in the Green River Eocene of Fossil Canyon, Utah. Subsequently he described four additional species from the Miocene of Florissant, and remarked that he was acquainted with still other species from the White River basin (Green River Eocene). The genus is not so aberrant as Scudder believed, being in effect a *Cylindrotoma* with an additional cross-vein between  $R_{4+5}$  and the anterior branch of the media, making a closed cell above the discal. Alexander regards the Cyliindrotominae as a decadent group, not nearly so well developed to-day as in Tertiary times. In his phylogenetic tree, he places the subfamily as an offshoot near the base of the stem, not leading to any further developments. The larvae are quite exceptional among Tipulidae in feeding on the leaves of plants. *Cylindrotoma* has six species of the North Temperate Zone, three being American.

## CYTTAROMYIA RECLUSA, new species.

Plate 2, fig. 1.

*Male*.—Length 13.5 mm.; wings 12 mm.; slender; vertex brown, but orbits pale; thorax brown without evident markings; halteres about 2 mm. long, very slender, with large abrupt knobs; abdomen pale brown, very slender basally, broader toward the apex, where the segments show pale bands, anterior to which, laterally, are large pale areas; there are also rather indistinct pallid discal marks in pairs. The pale bands and lateral patches are similarly indicated in Scudder's *C. oligocena* from Florissant. Wings pale brownish without conspicuous markings, but the end of the marginal cell and the veins bounding the discal cell apically are somewhat clouded, the apical clouding of the marginal cell being as in *Cylindrotoma*. The discal cell is elongate, being about 1,840 microns long and 640 microns wide at the broadest (subapical) part, whereby the species is readily separated from *C. fenestrata* Scudder, which is also a considerably smaller insect. The venation is almost as in *C. oligocena*, but the discal cell is distinctly longer and more slender; the wings of *C. oligocena* are only 9.6 long. The marginal cell is distinctly longer than the width of the wing; its first section (to separation of third vein) is about 2,480 microns, the second section 1,810 microns. The third posterior cell is distinctly shorter than the discal, and thus in Scudder's key the species runs to *C. cancellata* Scudder, a species with wings 9 mm. long, from Florissant. The basal part of the marginal cell is proportionately shorter in *cancellata*.

*Horizon and locality*.—Green River Eocene, Roan Mountains, Colorado, collected by John Byram at Station 5, at end of spur west of that on which the Ute trail passes, opposite the head of Salt Wash.

*Holotype*.—Cat. No. 69178, U.S.N.M.

## Family SYRPHIDAE.

## SYRPHUS EOCENICUS, new species.

Plate 2, fig. 2.

Robust, 12 mm. long; abdomen 7 mm. long and 4.5 mm. wide; head and thorax black, the scutellum not pallid as in modern *Syrphus*, but appearing a shade lighter than the abdominal bands; abdomen with very well-defined markings, the three broad light bands all interrupted by a narrow median band, somewhat broader, but still very narrow, on first segment; the light bands reach the extreme margins, and are of approximately equal width, the first however conspicuously wider mesally than the others, the upper edge of the second dark band presenting a double curve on each side; the other dark bands also have a double curve on each side, but not sufficiently

to make the light bands appear arcuate; the third light band is much wider at the sides than mesally; there is a fourth light band, broadly interrupted mesally, its inner ends pointed. Wings not preserved.

*Horizon and locality*.—Green River (Eocene) shales, Roan Mountains, Colorado, July, 1922; Station 1, near the head of the Ute trail, above Sellers Ranch (*John Byram*).

*Holotype*.—Cat. No. 69179, U.S.N.M.

A beautiful specimen, although lacking the wings. It appears to be close to *S. umbellatorum* Schiner, but considerably larger, with dark scutellum. It is much larger than *S. lithaphidis* Cockerell, found fossil in the Eocene of Cathedral Bluffs.

## HOMOPTERA.

### THAMNOTETTIX EOCENICUS (Cockerell).

*Erythroneura eocenica* COCKERELL, Proc. U. S. Nat. Mus., vol. 57, 1920, p. 246.

A second specimen was found by Mr. John Byram at Station 5 in the Roan Mountains, Colorado, July, 1922. It differs from the type in having the lower of the pale spots near middle of tegmen absent on one side, and small and round on the other. This is doubtless only an individual variation. The hind wings are well preserved, and show the venation of the Jassini, not that of *Erythroneura*. The insect must therefore be referred to *Thamnotettix*, a genus with members so similar to the Typhlocybines that Motschoulsky (1863) described members of the latter group under the former generic name. The base of the second apical cell of the hind wing is very slender, and very narrowly truncate by a short, hardly noticeable cross-vein. The base of the fourth apical cell is oblique, not transverse, the lower corner more basal. This last character agrees with *Thagria signata* Distant from Ceylon, but in that insect the fourth apical is much shorter and broader. The base of the fourth apical in our fossil is approximately half way between those of the second and third.

### PROTOLIARUS HUMATUS Cockerell.

Mr. F. Muir writes that he believes this can not be one of the Cixiidae (still less a proto-Cixiidae), but is rather a proto-Flatid or proto-Ricaniid. He considers that my subcostal vein is really the costal, which is in the membrane in many Fulgorids. The true subcosta is fused with the radius at the base, as my figure shows. Mr. Muir adds that the apparent cross-vein between the media and cubitus may be the fourth branch of the media joining the cubitus, as it often does in existing Flatidae.



**THAUMASTOCLADIUS SIMPLEX** Cockerell and Sandhouse.

Mr. F. Muir believes that this should go in the Flatoidinae. So far as he can judge from the figure, it appears that the suture is indistinct, perhaps because it lies very close to the cubitus, as it does in a number of living species. He would then interpret it as follows: A large costal membrane with cross-veins, subcosta and radius free to base or near base, media branching about middle, cubitus branching much more apically. "Your reference to *Gaja* is then much more appropriate." The figure of *Thaumastocladius* is upside down, as may be readily seen by comparing the description.

**LITHOPSIS DUBIOSA** Cockerell and Sandhouse.

This is also referred by Mr. Muir to the Flatoidinae, as is indicated by the shape of the head and the position of the tegmina. In this group the tegmina are carried nearly flat horizontally, and the fossil appears to have had them in this position.

**HETEROPTERA.****DELPHAX SENILIS** Scudder.

Plate 2, fig. 3.

Green River Eocene; "Cathedral Bluffs south of Little Tommies Draw, at point where samples were taken." (Winchester 17.5, U.S.G.S.) Total length 2.5 mm.; tegmina 2.6 mm. long and .70 mm. wide, uniform pale coffee-brown; abdomen with a broad dark median band, but basal and apical parts pallid. Close to *D. veterum* Cockerell, but considerably smaller, with narrower tegmina.

*Plesiotype*.—Cat. No. 69186, U.S.N.M.

**DINIDORITES MARGIFORMIS** Cockerell.

An additional specimen is U.S.G.S. 219, with reverse 220, obtained by Scudder in the Roan Mountains, Colorado.

**ODONATA.****EPALLAGITES**, new genus.

Small, slender dragon-flies with dark thorax and hyaline wings; abdomen very slender, Arculus at not quite a third of distance from base to nodus; basal space not crossed; antenodal cross-veins numerous, crossing both costal and subcostal cells, continuous from one to the other, or almost so; two antenodals before arculus and one immediately above it, as in *Amphipteryx*; upper section of arculus long, as in *Rhinocypha*; probably over 15 cross-veins between level of arculus and nodus, forming cells which are (in the case of a few

of the more basal ones) square, or broader, in the manner of *Anisopleura*. Other characters not visible.

*Genotype*.—*Epallagites avus*, new species.

EPALLAGITES AVUS, new species.

Plate 1, fig. 4.

Head about 5 mm. broad; about 1.4 mm. between eyes on vertex; thorax about 6 mm. long, as preserved black without bands; abdomen very slender, but only partly preserved. Wings hyaline, the veins not very dark; base to arculus 4 mm.; arculus to nodus about 9 mm.

*Horizon and locality*.—Green River (Eocene) shales at head of Salt Wash, Roan Mountains, Colorado, collected July, 1922 (Cockrell). The locality is a large excavation, probably 150 meters (500 feet) below top of hill, which we called Station 2.

*Holotype*.—Cat. No. 69180, U.S.N.M.

In Tillyard's classification, this will fall in the tribe Epallagini, except for the fact that the arculus is not so near the base. The wings can hardly be described as petiolate, though they are not broad. On the whole, *Epallagites* falls between the Epallagini and Libellagini, and possibly these tribes were not so clearly separated in the Eocene as at present. The most nearly related genus in the American Eocene is *Protamphipteryx*, but this belongs to Tillyard's tribe Amphipterygini. The definition which he gives of that tribe needs to be amended to admit the Oriental genus *Devadatla* Kirby, in which the arculus is actually nearer the nodus than to the base of the wing.

The discovery of a second genus of Epallaginæ in the Green River Eocene is of particular interest because the subfamily not only shows some very primitive characters, as Kennedy has remarked, but is actually the oldest of the living Zygopterous groups. Two genera from the Jurassic, *Euphacopsis* and *Pseudoeuphaea* of Handlirsch, are placed in the Epallaginæ, though it must be confessed that they need further investigation.

## HYMENOPTERA.

AMASIS BYRAMI, new species.

Plate 2, fig. 5.

Length slightly over 8 mm.; width of head slightly over 2 mm., of the thorax about 3 mm., of abdomen 3.2 mm.; head and thorax dark brown; antenna 5-jointed, strongly clavate, pale brown; wings clear (venation not visible); abdomen pale, the sutures beyond the middle dusky. Length of antennal joints in microns: (1) about 320, (2) 112, and broader than long, (3) 560, (4) 240, (5, club), 830, and

352 broad. The club is very well preserved and is positively not divided.

*Horizon and locality.*—Green River Eocene, head of East Alkali Gulch, about 8 miles south of De Beque, Colorado, 1922. (John P. Byram.)

*Holotype.*—Cat. No. 69181, U.S.N.M.

Compared with the modern (European) *A. crassicornis* (Rossi), the second antennal joint is shorter, and the third is much longer in proportion to the fourth, while the club is broader basally. Possibly, if we had the wings, it might be necessary to describe a new genus, but so far as the specimen shows it may well go in *Amasis*. The genus *Amasis* consists to-day of 17 species and some named varieties, occupying the Palaearctic region from Siberia to Morocco and France. *Amasis dilatata* Lepeletier and *A. subflavata* Kirby, described from Brazil and Argentine, respectively, are referred by Konow to the related genus *Plagioceros* Klug. In 1909 Mocsary described *A. brasiliensis* from Brazil and *A. neotropica* from Paraguay. The distribution is somewhat analogous to that of the Cameliidae, and fossil *Amasis* in America might have been expected.

Another specimen of *A. byrami*, from the same place, is 9.5 mm. long.

#### HOPLISUS ARCHORYCTES Cockerell.

Plate 1, fig. 5.

This remarkable specimen, described in Nature,<sup>8</sup> was found by Mr. John Byram in the Green River shales at the head of Bear Gulch, Colorado. As the figure shows, it is entirely of a modern type, in spite of its great antiquity, no older wasp being known. For the origin of the Fossores we must evidently go back to the Mesozoic.

*Holotype.*—Cat. No. 69182, U.S.N.M.

## COLEOPTERA.

### Family MORDELLIDAE.

#### MORDELLA PRISCULA, new species.

Plate 1, fig. 7.

Length about 3 mm.; robust, dark brown, the elytra somewhat paler, without spots, but with the sutural margin darkened, in the manner of *Mordellistena grammica* LeConte; caudal style of moderate length (rather over half a millimeter), not very slender; legs reddish-brown; hind tibiae with a single well-developed dark ridge close to and parallel with the broad margin; hind tarsi formed as

<sup>8</sup> Sept. 2, 1922, p. 313.

usual in the genus, without ridges, the basitarsi about as long as the next two joints together.

*Horizon and locality.*—Green River Eocene of Roan Mountains, Colorado, July, 1922, at Station 2, at head of Salt Wash.

*Holotype.*—Cat. No. 69183, U.S.N.M.

This little species looks like a *Mordellistena*, but the hind legs are very well shown, and are as in *Mordella*. It is the first Eocene Mordellid, the oldest members of the family hitherto known being from Baltic Amber. It is interesting to find such a well-marked and specialized family of beetles in the Eocene; one more indication that the families of insects were at least nearly all developed prior to the Tertiary. Wickham has described no less than eight species of Mordellidae from the Miocene of Florissant, but no others have hitherto been found fossil in America.

### Family MELANDRYIDAE.

#### CICINDELOPSIS EOPHILUS Cockerell.

Dr. Walther Horn, of Berlin, the well-known specialist in Cicindelidae, wrote that he could not place *Cicindelopsis* in that family. I accordingly requested Herbert S. Barber to look at the fossil, which he very kindly did, and in his opinion it should be associated with the Melandryidae, somewhere in the vicinity of *Prothalia* LeConte. The family is new to the American Eocene, but a single species of *Synchroa* has been found in the Miocene of Florissant. The generic name, which merely indicates resemblance to *Cicindela*, is still appropriate.

Mr. Barber was able to remove a fragment of the matrix from over the base of the elytron, and decided that the humeral obliquity was mistaken by me for the scutellar emargination, so that the specimen is a left instead of right elytron.

### Family CERAMBYCIDAE.

#### CLYTUS (?) PERVETUSTUS (Cockerell).

Plate 1, fig. 3.

Described as *Lema* (?) *pervetusta* Cockerell.<sup>9</sup>

Another specimen; Green River Eocene, above rich shale in Camp Gulch, Colorado (Winchester, 17-8), showing the whole elytron, which is 9 mm. long, with four pale transverse bands, the second oblique, the others transverse, except that the fourth has its outer half oblique. This can not be a *Lema*; it may possibly be a Longicorn allied to *Leptura*, but at present I find no genus in which it may

<sup>9</sup> Proc. U. S. Nat. Mus., vol. 57, 1920, p. 256.

be confidently placed. The new specimen shows neither punctures nor striae. The general aspect is suggestive of the Clytini, the oblique second band being very much as in the European *Clytus* (*Anaglyptus*) *mysticus* Linnaeus (specimen from Southwater, Sussex, compared). I provisionally transfer the insect to *Clytus*, which is at any rate more plausible than *Lema*. The elytron is not truncate as in *Clytus*, and the reference can not be more than approximate. The dark apex agrees with *Leptura*.

*Plesiotype*.—Cat. No. 69185, U.S.N.M.

## ARACHNIDA.

### Family LINYPHIIDAE.

#### LINYPHIA BYRAMI, new species.

Plate 1, fig. 8.

*Male*.—Length hardly 3 mm., the abdomen very small; color very pale, but femora dark brown, broadly pallid basally; patellae brown; tibia broad apically and pallid basally; femora very stout, patellae and tibiae with long spines, as in modern *Linyphia*. The following measurements are in microns: Length of anterior femur 1,600, width 450; length of anterior patella plus tibia about 1,520, width of tibia 240; length of spine at end of anterior patella 520; spines on outer side of anterior tibia about 320; length of second femur about 1,650; length of fourth patella plus tibia 1,200, the patella with a long spine as on front legs.

*Horizon and locality*.—Green River Eocene, head of East Alkali Gulch, about 8 miles south of De Beque, Colorado. (John P. Byram, 1922.)

*Holotype*.—Cat. No. 69184, U.S.N.M.

Although this spider fails to exhibit many of the more important diagnostic features, the general appearance, marking of the legs, and spines are so exactly those of *Linyphia* that the reference to the modern genus appears justified. Petrunkevitch (1922) records four species of *Linyphia* from the Miocene of Florissant. One species is known from Baltic amber (*L. oblonga* Berendt).

While looking up the literature of fossil spiders, I notice that the living *Phidippus formosus* Peckham, 1883, requires a new name on account of the amber *P. formosus* Berendt, 1854. Peckham's species may be designated *P. homarinus*, new name, from a certain resemblance in the marking of the abdomen to a lobster's claw. So also, *Clubiona sericea* (Cambridge, 1898), from Mexico, is preoccupied by an amber species; the name may be changed to *C. tabascani*, new name.



## 3. A MIOCENE EARWIG.

## LABIDUROMMA EXSULATUM Scudder.

Plate 1, fig. 6.

Scudder only figured the female of this Florissant species; opportunity is taken to figure the male (U.S.G.S., 1607, with reverse, 1606). Except for the large eyes, typical of *Labiduroomma*, one might take the insect for a *Forficula*. It is possible to see the first two joints of the anterior tarsi, and the second joint is heart-shaped, as in *Forficula*. The first joint, however, is stout and swollen, pyriform in outline as seen from above. The last dorsal segment is obtusely subangulate in the middle. The very stout forceps are broad and contiguous basally, as in certain species of *Forficula*.

In the very large collections from the Green River Eocene, no Earwig has been found.

*Plesiotype*.—Cat. No. 69187, U.S.N.M.

## 4. A FOSSIL BEETLE FROM WASHINGTON STATE.

I am greatly indebted to Dr. F. H. Knowlton for the opportunity to study a fossil elytron from a new locality, Deep Creek Canon, near Spokane, Washington. It was found "in clay beds interbedded with volcanic flows of Upper Miocene age, associated with a large and beautifully preserved flora." At Doctor Knowlton's suggestion, I am very glad to name it after C. O. Fernquist, of Spokane, who collected it and has given much aid in collecting and forwarding fossil plants. The species belongs to a well-known modern genus of Carabidae.

## CALOSOMA FERNQUISTI, new species.

Plate 2, fig. 8.

Elytron 20.5 mm. long, 7 broad, the apex more produced and pointed than in *C. scrutator* Fabricius; 18 longitudinal striae, which are strongly punctured, or 19, counting the short inner basal one which is about 4 mm. long; punctures connected transversely by shallow sulci, as in living species; in middle of elytron about 11 punctures in 3 mm. longitudinally; foveae in fourth and eighth interspaces (counting from inner margin) not very distinct, but essentially as in *C. scrutator*.

The *C. scrutator* compared is from Geneva, Ohio (Mrs. Nellie B. Henderson). In the form of the elytron, with comparatively acute apex, this is much more like *C. externum* Say, of the eastern United States; it was on account of this feature that Dejean named Say's species *longipenne*. Doctor Knowlton showed the fossil to Dr. E.

A. Schwarz, who remarked that it was with difficulty separable from the modern *C. externum*.

*Holotype*.—Cat. No. 69218, U.S.N.M.

Three species of *Calosoma* have been described from the Florissant Miocene. The following key, based on the elytra, separates the fossil species of *Calosoma* of America.

Elytron 13 mm. long, without punctures.....*emmonsii* Scudder.  
Elytron about 17 mm. long, greatest width less than 6.5 mm.

Interstices between striae divided into quadrate spaces by transverse lines (as in *C. scrutator*).....*calvini* Wickham.

Interstices not so marked.....*cockerelli* Wickham.  
Elytron over 20 mm. long, 7 broad; interstices between striae divided into quadrate spaces.....*fernquisti* Cockerell.

No less than eight species of *Calosoma* are known from the Upper Miocene of Europe (Baden and Switzerland). One (*C. heeri*) was described by Scudder, the rest by Heer. One supposed *Calosoma* (*C. agassizi*) from the French Oligocene is now referred to the related genus *Calliothenes*. Handlirsch credits this species to Oustalet, 1874, but I believe it is the *Carabus agassizi* Barthelemy-Lapommeraye, 1846. (In 1850 Le Conte named a *Carabus* from Lake Superior after Agassiz, but he called it *C. agassii*. It is a form of *C. taedatus* Fabricius.)

#### EXPLANATION OF PLATES.

##### PLATE 1.

FIG. 1. *Dinopanorpha megarche* × 3.

2. *Amagua fortis* × 3.

3. *Clytus* (?) *pervetustus* × 6.

4. *Epallagites avus* × 2.

5. *Hoplisis archoryctes* × 3.

6. *Labiduromma exsulatum* × 3.

7. *Mordella priscula* × 6.

8. *Linyphia byrami* × 6.

##### PLATE 2.

FIG. 1. *Cyttaromyia reclusa* × 3.

2. *Syrphus eocenicus* × 3.

3. *Delphax senilis* × 6.

4. *Acnemia cyclosoma* × 4.

5. *Amasis byrami* × 4.

6. *Plecia rhodoptera* × 6.

7. *Eophlebomyia claripennis* × 6.

8. *Calosoma fernquisti* × 2.